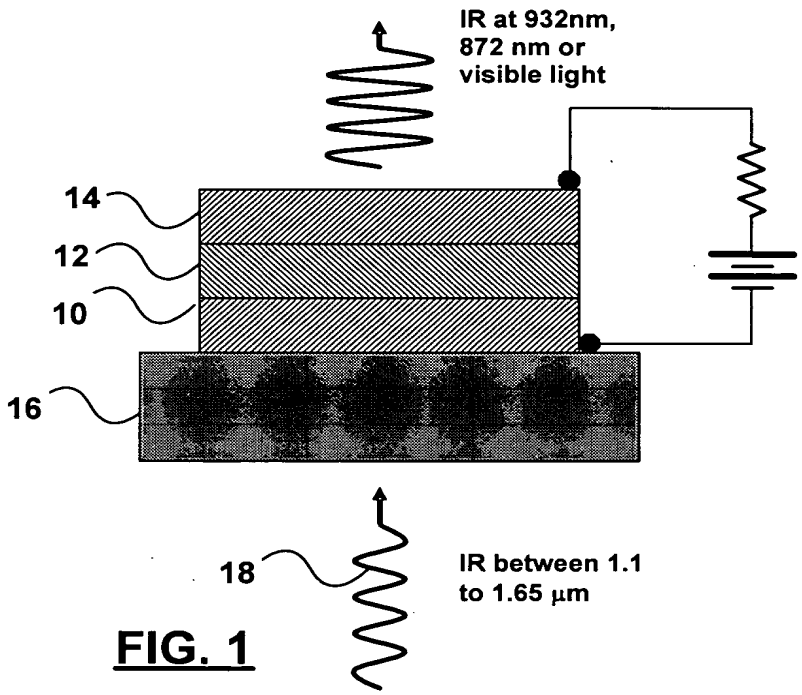
IR at 932nm,
872 nm or
visible light
14
12
10
16
18
IR between 1.1
to 1.65 μm

FIG. 1

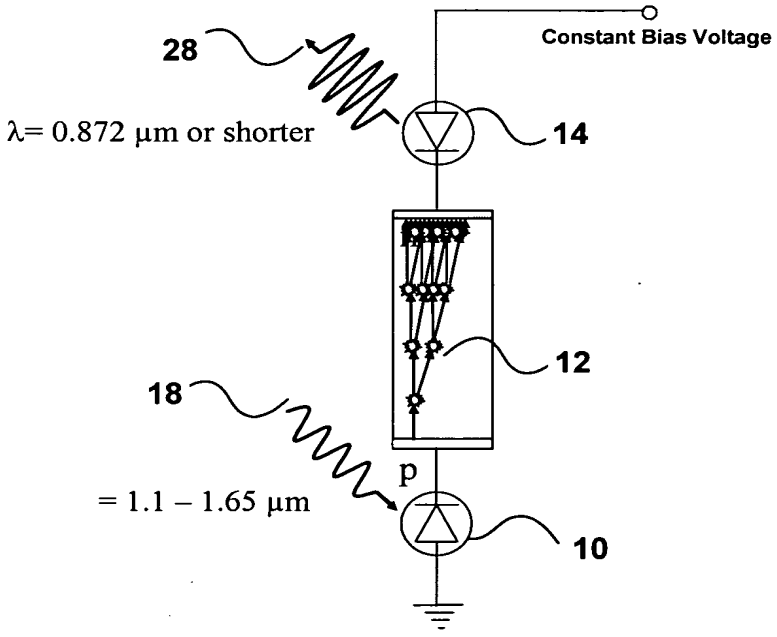
28
Constant Bias Voltage
λ= 0.872 μm or shorter
14
12
18
p
= 1.1 – 1.65 μm
10

FIG. 2

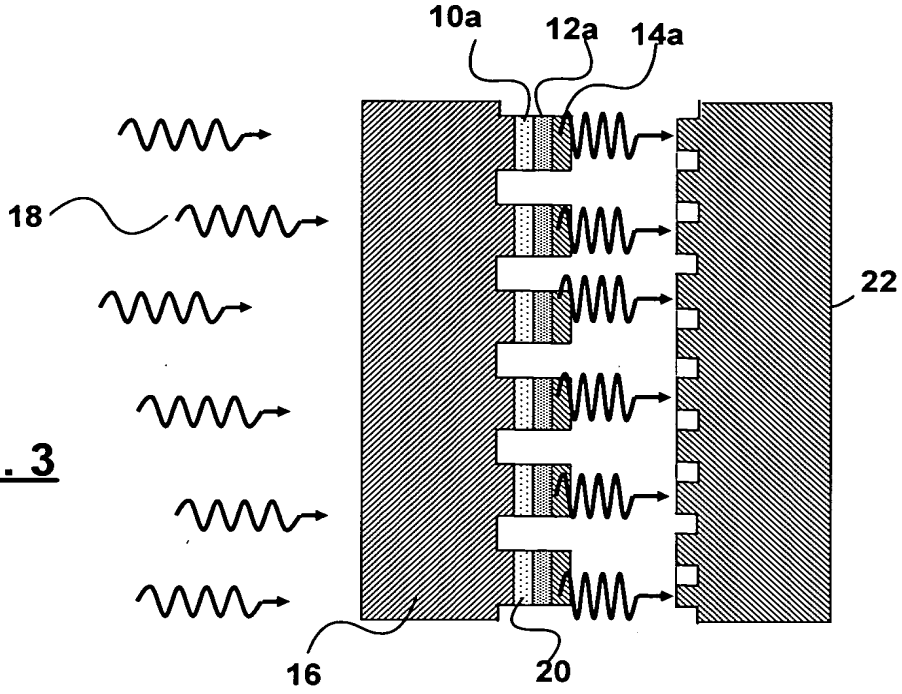

FIG. 3

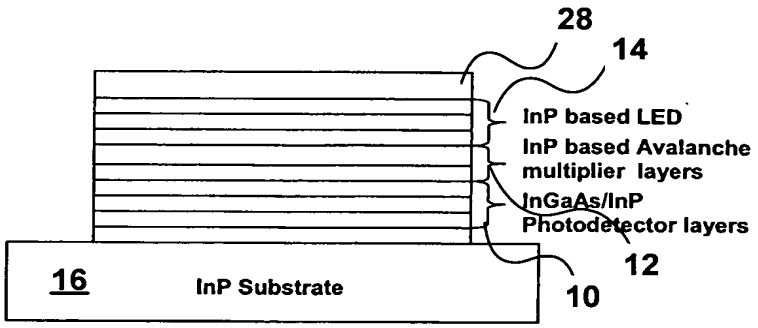

FIG. 4a

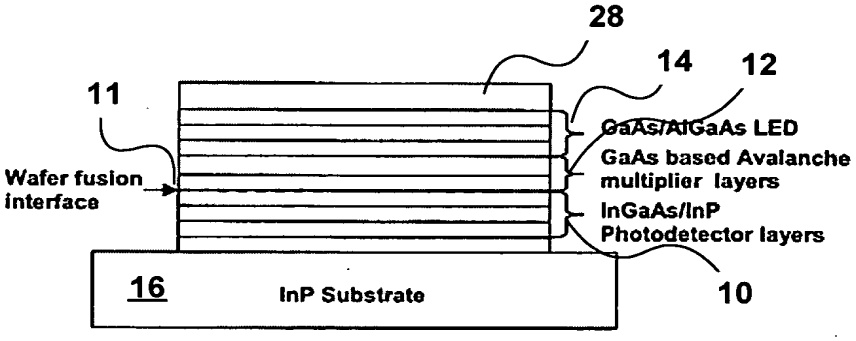

FIG. 4b

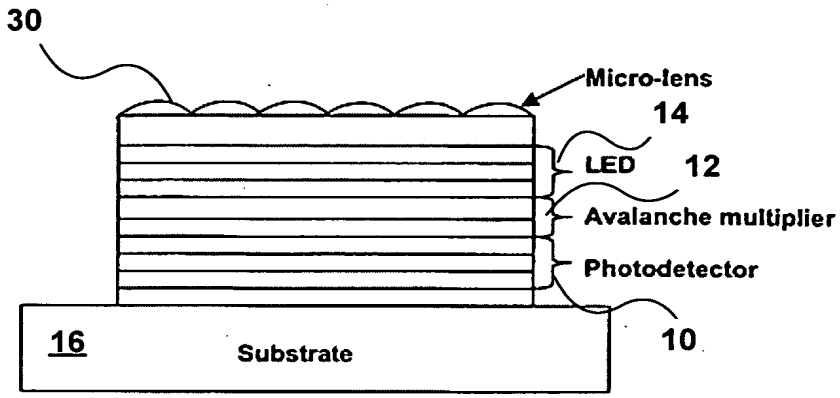

FIG. 5a

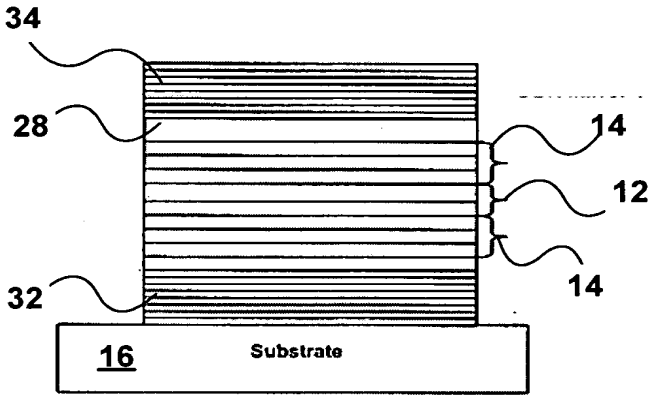

FIG. 5b

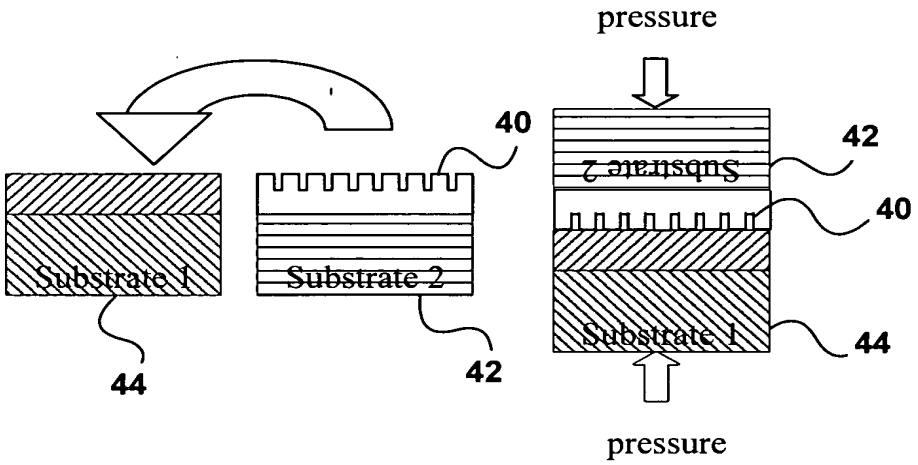

FIG. 6a

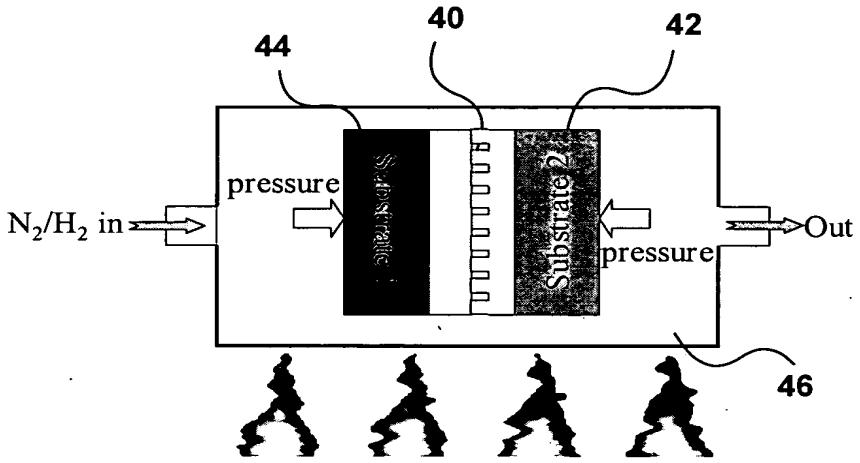
40
42
44
pressure
N_2/H_2 in
Substrate 2
pressure
Out
46

FIG. 6b

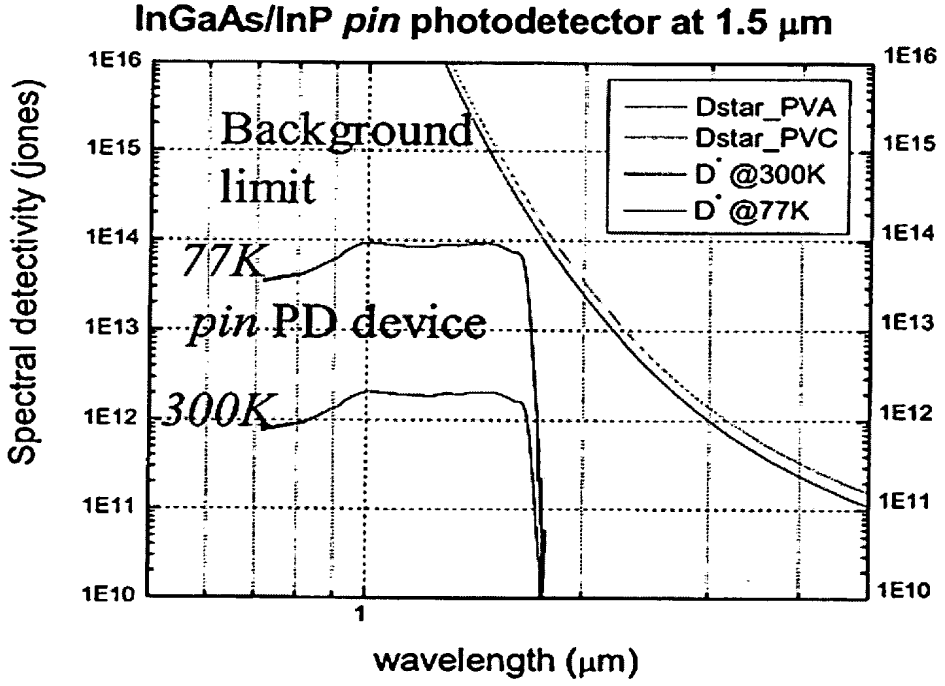
InGaAs/InP pin photodetector at 1.5 μm
Spectral detectivity (jones)
1E16
1E15
1E14
1E13
1E12
1E11
1E10
Background limit
77K
pin PD device
300K
Dstar_PVA
Dstar_PVC
D* @300K
D* @77K
1
wavelength (μm)

FIG. 7

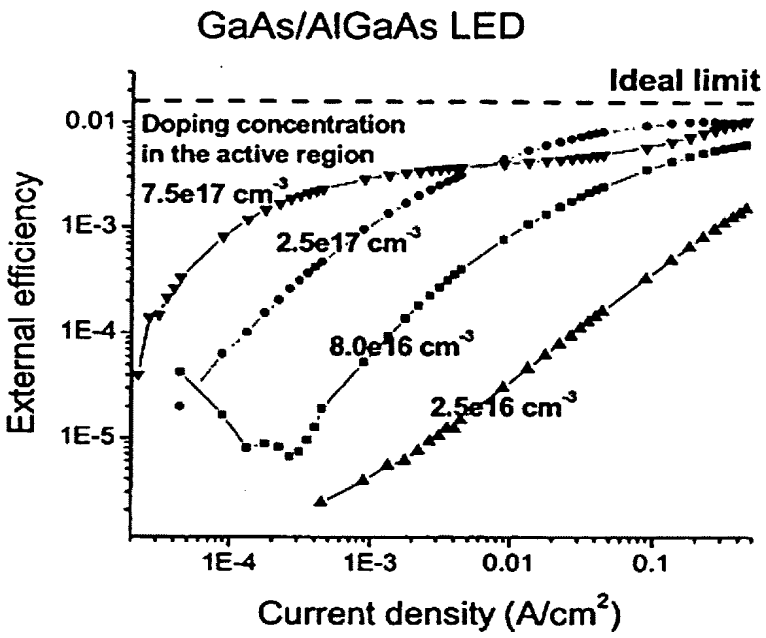
GaAs/AlGaAs LED
Ideal limit
Doping concentration
in the active region
7.5e17 cm-3
2.5e17 cm-3
8.0e16 cm-3
2.5e16 cm-3
External efficiency
0.01
1E-3
1E-4
1E-5
1E-4
1E-3
0.01
0.1
Current density (A/cm2)

FIG. 8

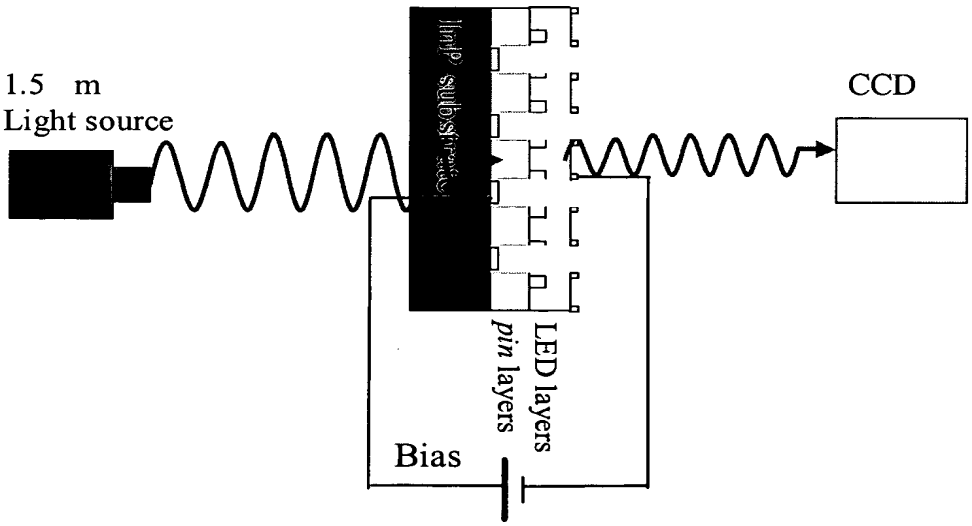
1.5 m
Light source
CCD
InP substrate
pin layers
LED layers
Bias

FIG. 9a

FIG. 9b

CCD camera image
of a working device

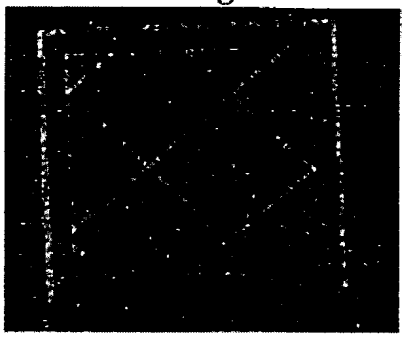

FIG. 10a

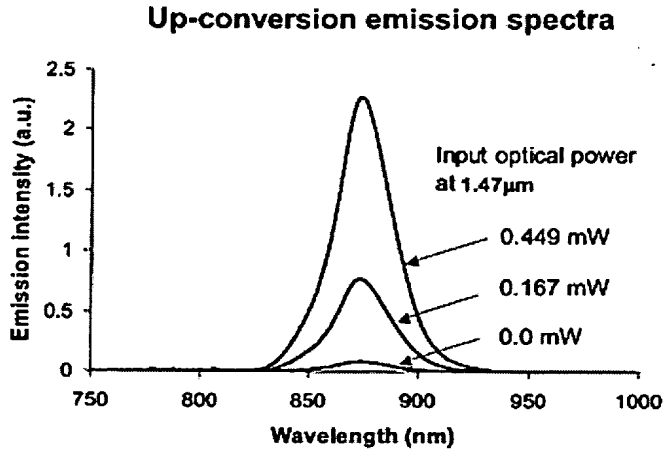
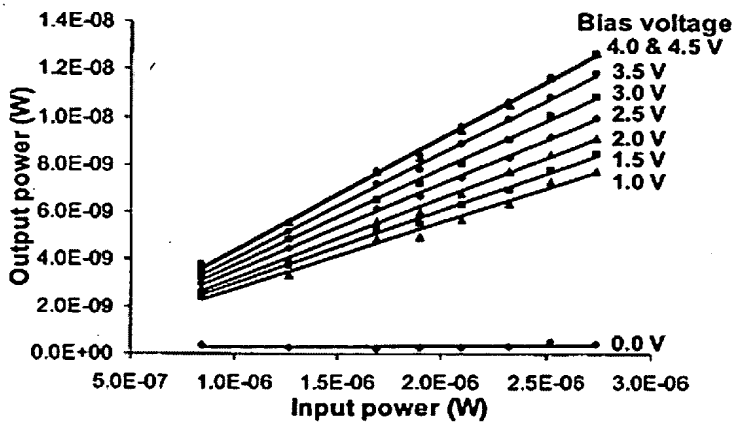
FIG. 10b